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ABSTRACT

Numerous scientific investigations show that air inside office buildings and residences can be contaminated by a large variety of toxic contaminants, some in concentrations sufficient to adversely affect the health of those exposed. The internal building environment of new or recently remodeled buildings may be responsible for illnesses sometimes referred to as "tight building syndrome" or "sick building syndrome." This guide to the literature on indoor air pollution is not intended to be a comprehensive bibliography. It is designed to provide the reader with a set of resources that can be used to focus on the topic. The document lists the subject headings used by the Library of Congress in cataloging information on indoor air pollution. It also contains citations of materials categorized as: (1) brief introductions; (2) basic texts; (3) additional titles; (4) handbooks and encyclopedias; (5) other bibliographies; (6) conference proceedings; (7) government publications; (8) abstracting and indexing services; (9) journal articles; (10) technical reports; and (11) additional sources of information. (TW)

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## INDOOR AIR POLLUTION

Compiled by Jane Collins

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SCOPE: Numerous scientific investigations show that air inside office buildings and residences can be contaminated by a large variety of toxic contaminants, some in concentrations sufficient to adversely affect the health of those exposed. Pollutants from indoor sources may include sidestream tobacco smoke, radon and radon decay products, mineral and vitreous fibers (e.g., asbestos), formaldehyde, combustion by-products (e.g., nitrogen dioxide, carbon monoxide, sulfur dioxide), aeropathogens (bacteria, viruses, fungi), allergens (molds, dust, danders) and pesticides.

The internal building environment of new or recently remodeled buildings may be responsible for illnesses sometimes referred to as "tight building syndrome" or "sick building syndrome." Building fabrics, tightness of the building due to energy conservation measures, or other aspects of design or remodeling may be implicated.

This guide does not include references to publications pertaining to air within buildings in which hazardous airborne substances may be expected due to industrial or commercial processes. Not intended to be a comprehensive bibliography, this guide is designed--as the name of the series implies--to put the reader "on target."

Introductions to the topic appear in:

Gold, Michael. Indoor pollution. In Encyclopedia science supplement: a modern science anthology for the family. 1982. Danbury, Conn., Grolier, Inc., 1982. p. 220-225. Q9.E5*

Nero, Anthony V., Jr. Indoor air: new battleground against pollution. In Yearbook of science and the future 1986. Chicago, Encyclopaedia Britannica, Inc., 1986. p. 188-201. Q9.B78 1986*

SUBJECT HEADINGS used by the Library of Congress, under which books on indoor air pollution can be located in most card, book, and online catalogs, include the following:

AIR--POLLUTION, INDOOR (Highly relevant)
AIR--POLLUTANTS--ADVERSE EFFECTS (Relevant)
AIR POLLUTION--ADVERSE EFFECTS (Relevant)
AIR QUALITY (Relevant)



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OFFICES--HYGIENIC ASPECTS (Relevant)
RADON (Relevant) and other terms for toxic contaminants, e.g., ASBESTOS, FORMALDEHYDE, etc.
VENTILATION--HYGIENIC ASPECTS (Relevant)

## BASIC TEXTS

Air pollution. Edited by Arthur C. Stern. 3d ed. New York, Academic Press, 1976- 5 v. TD883.S83 1976*

Brief, R., W. S. Kerball, and D. Taylor, eds. Indoor environmental quality manual. Prepared by the AIHA Indoor Environmental Quality Committee. Akron, Ohio, American Industrial Hygiene Association, 1987. 1 v. In press
Contents: Chap. 1. Ventilation.--Chap. 2. Formaldehyde.--Chap. 3. Respirable particulates.--Chap. 4. Pesticides.--Chap. 5. Microorganisms.--Chap. 6. Nitrogen oxides.--Chap. 7. Carbon Monoxide.--Chap. 8. Volatile organic compounds.--Chap. 9. Odor.--Chap. 10. Asbestos.
To be published May 1987.

Godish, Thad. Air quality. Chelsea, Mich., Lewis Publishers, c1985. 372 p. TD883.G57 1985*

Indoor air quality. Editors, Phillip J. Walsh, Charles S. Dudney, and Emily D. Copenhaver. Boca Raton, Fla., CRC Press, c1984. 207 p. TD883.2.I527 1984

Makower, Joel. Office hazards: how your job can make you sick. Washington, Tilden Press, c1981. 233 p. RC965.O3M34

The Medical and biological effects of light. Edited by Richard J. Wurtman, Michael J. Baum, and John T. Potts, Jr. New York, New York Academy of Sciences, 1985. 408 p. (Annals of the New York Academy of Sciences, v. 453) Q11.N5
Based on the Conference on Medical and Biological Effects of Light, held in New York City on Oct. 31 to Nov. 2, 1984, by the New York Academy of Sciences.

Meyer, Beat. Indoor air quality. Reading, Mass., Addison-Wesley Pub. Co., 1983. 434 p. TD883.1.M49 1983
Includes indexes.
Bibliography: p. 337-397.

Nagda, Niren Laxmichand, Harry E. Rector, and Michael D. Koontz. Guidelines for monitoring indoor air quality. Washington, Hemisphere Pub. Corp., c1986. 275 p. TD883.1.N34 1986

Turiel, Isaac. Indoor air quality and human health. Stanford, Calif., Stanford University Press, 1985. 173 p. RA575.5.T87 1985
Bibliography: p. 151-160.

Wadden, R. A., and Peter A. Scheff. Indoor air pollution: characterization, prediction, and control. New York, Wiley, c1983. 213 p. TD883.1.W33 1983*

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The Airliner cabin environment: air quality and safety. Committee on Airliner Cabin Air Quality, Board of Environmental Studies and Toxicology, Commission on Life Sciences, National Research Council. Washington, National Academy Press, 1981. 303 p.
Not yet in LC collections

Indoor pollutants. Committee on Indoor Pollutants, Board of Toxicology and Environmental Health Hazards, Assembly of Life Sciences, National Research Council. Washington, National Academy Press, 1981. 537 p. TD883.1.I5*

United States. Congress. House. Committee on Science and Technology. Subcommittee on Energy Development and Applications. Indoor air quality research: hearings before the Subcommittee on Energy Development and Applications and the Subcommittee on Natural Resources, Agriculture Research, and Environment of the Committee on Science and Technology, U.S. House of Representatives, Ninety-eighth Congress, first session, August 2, 3, 1983. Washington, U.S. Govt. Print. Off., 1984. 508 p. KF27.S3934 1983d

United States. Congress. House. Committee on Science and Technology. Subcommittee on Natural Resources, Agriculture Research, and Environment. Radon and indoor air pollution: hearing before the Subcommittee on Natural Resources, Agriculture Research, and Environment of the Committee on Science and Technology, U.S. House of Representatives, Ninety-ninth Congress, first session, October 10, 1985. Washington, U.S. Govt. Print., Off., 1986. 291 p. KF27.S3978 1985e

United States. Congress. Senate. Committee on Environment and Public Works. Indoor air pollution: hearing before the Committee on Environment and Public Works, United States Senate, Ninety-ninth Congress, first session, on S. 1198 ... August 5, 1985, Augusta, Me. Washington, U.S. Govt. Print. Off., 1985. 68 p. KF26.E6 1985n
Senate hearing, 99-210.

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"CED-80-111."
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World Health Organization. Indoor air pollutants: exposure and health effects. Report on a WHO meeting, Nordlingen, 8-11 June 1982. Copenhagen, World Health Organization, Regional Office for Europe, c1983. 42 p. (EURO reports and studies, 78) RA575.5.W67 1983

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Concentrations of indoor pollutants (CIP): data base, user's manual and bibliography. Berkeley, Calif., Indoor Environment Program, Lawrence Berkeley Laboratory, University of California, 1985-1986. 1 v. and 6 computer disks ( 5 1/4 in.)
Request in Science Reading Room

Updated periodically.

Current release contains 238 bibliographic references and 132 summary datasets.

System requirements for floppy disk: IBM PC, XT or AT or compatible with DOS 2.0 or later; minimum 320K of memory and two floppy drives.

The CIP data base contains a bibliography of field measurements of air pollutants in buildings. Summary data is available for some citations which includes the abstracts, discussion, conclusions, information relating to site and experimental methodology.

Indoor air pollution. November 1984-October 1985 (Citations from the Energy Data Base). Prepared in cooperation with the Dept. of Energy, Washington, D.C. Springfield, Va., National Technical Information Service, Oct. 1985. 240 p. Not in LC collections
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PB85-104180**, etc.

Contents: v. 1. Recent advances in the health sciences and technology (PB85-104180**)--v. 2. Radon, passive smoking, particulates and housing epidemiology (PB85-104198**)--v. 3. Sensory and hyperactivity reactions to sick buildings (PB85-104206**)--v. 4. Chemical characterization and personal exposure (PB85-104214**)--v. 5. Buildings, ventilation and thermal climate (PB85-104222**).

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Evaluating office environmental problems. Cincinnati, Ohio, American Conference of Governmental Industrial Hygienists, 1984. 136 p. (Annals of the American Conference of Governmental Industrial Hygienists, v. 10) TD883.2.E94 1984

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Indoor air and human health. Edited by Richard B. Gammage, Stephen V. Kaye; technical editor, Vivian A. Jacobs. Chelsea, Mich., Lewis Publishers, c1985. 430 p. RA577.5.I53 1985*
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Sixty seven articles representing a substantial contribution to the scientific and technical understanding of the sources, concentrations, human exposures, health and comfort aspects encountered in the indoor environments. Articles cover contaminant controls, ventilation, and the interaction between energy conservation and indoor air quality, policy and public health concerns, sources, concentrations and exposures to radon, organics, formaldehyde, nitrogen dioxide, carbon monoxide, and aerosols. Extensive references.

Indoor air quality: future priorities and programs. Proceedings of a conference sponsored by the Consumer Federation of America. Washington, The Federation, 1985. 47 p. Pamphlet box*
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Conference title from Appendix B.
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Indoor air quality in cold climates: hazards and abatement measures. Transactions of an APCA Specialty Conference. Edited by Douglas S. Walkinshaw. Sponsored by APCA's TT-7 Indoor Air Quality Committee ... and others. Pittsburgh, Penn., Air Pollution Control Association, 1986. 626 p. Not yet in LC collections

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A major source of information on all aspects of indoor air pollution, including the quality of indoor air, carbon monoxide in houses and vehicles, indoor nitrogen oxides, radon, allergic agents, viruses and pollution, legionellosis, passive smoking, household risks with inorganic fibers, toxicity of organic compounds, inhalation of toxic products, psychological effects, building ventilation measurements and standards, social, legislative and economic considerations. Extensive references.

ABSTRACTING AND INDEXING SERVICES that index relevant or related articles and other literature are listed below. The subject headings listed at the beginning of this guide and terms beginning INDOOR AIR POLLUTION or AIR POLLUTION may be useful for searching.

Abstracts on Health Effects of Environmental Pollutants (1972-) RA565.A1A26*

Applied Science & Technology Index (1913-) Z7913.I7*

Biological Abstracts (1926-) QH301.B37*

Chemical Abstracts (1907-) QD1.A51*

EPA Publications Bibliography (1976-) Z5863.P7U58a*

Environment Abstracts (1971-) GF1.E553*

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Readers' Guide to Periodical Literature (1900-) AI3.R45

Note: Consult reference librarian for location of abstracting and indexing services in the Science Reading Room.

PERIODICALS which often contain articles on indoor air pollution include:

ASHRAE Journal TH7201.A22
American Society of Heating, Refrigerating and Air-Conditioning Engineers. Transactions TH7201.A5
Air Pollution Control Association. Journal TD883.A48
American Industrial Hygiene Association. Journal RC963.A135
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Atmospheric Environment TD881.A8
EHP, Environmental Health Perspectives RA565.A1E13
Environment International TD169.E54
Environmental Research RA565.E53
Environmental Science and Technology TD180.E5
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Molhave, L. Indoor pollution due to organic gases and vapors of solvents in building materials. Environment international, v. 8, 1982: 117-127. TD169.E54

Nero, Anthony V., Jr. The indoor radon story. Technology review, v. 89, Jan. 1986: 28-31, 36-40. T171.M47

Pickrell, John A. Formaldehyde release from selected consumer products: influence of chamber loading, multiple products, relative humidity and temperature. Environmental science & technology, v. 18, Sept. 1984: 682-686. TD180.E5

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See particularly: keyword Indoor

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Indoor air pollution and housing technology. Prepared by Bruce M. Small and Associates, Ltd., for the Canada Mortgage and Housing Corporation. Ottawa, Canada Mortgage and Housing Corporation, Aug. 1983. 295 p. Pamphlet box*

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"DE86005006."

Indoor air quality handbook: for designers, builders, and users of energy efficient residences. Prepared by Sandia National Laboratories for the U.S. Dept. of Energy. Washington, Office of Environmental Programs, Sept. 1982. 174 p. SAND82-1773**
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Nero, Anthony V., Jr. Indoor radiation exposures from radon and its daughters: a view of the issue. Prepared by Energy and Environment Division, Lawrence Berkeley Laboratory, University of California, for the U.S. Dept. of Energy. Washington, U.S. Dept. of Energy, Aug. 1981. 27 p. LBL-10525**
"DE82005144."

Manual on indoor air quality. Prepared by Applied Science Division, Lawrence Berkeley Laboratory, University of California, for the Electric Power Research Institute. Palo Alto, Calif., Electric Power Research Institute, Feb. 1984. 108 p. EPRI-EM-3469**
Topics covered include: indoor air pollution, air infiltration, weatherization, ventilation systems, monitoring and residential buildings.

The Status of indoor air pollution research, 1976: final report. Prepared by Geomet, Inc. Research Triangle Park, N.C., Environmental Monitoring and Support Laboratory, U.S. Environmental Protection Agency, May 1977. 486 p. PB272 597**
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Carey, John, and others. Beware 'sick-building syndrome.' Newsweek, v. 105, Jan. 7, 1985: 58-60.

Douville, Judith A. The chemical nature of indoor air pollution. Dangerous properties of industrial materials report, v. 4, May/June 1984: 3-8.

Edgar, Robert T. Effect of outdoor parameters on indoor air quality. In National Conference on Environmental Engineering: proceedings of the ASCE Specialty Conference, Hilton Harvest House, Boulder, Colorado, July 6-8, 1983. New York, American Society of Civil Engineers, 1983. p. 707-714.

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Spengler, John D., and Ken Sexton. Indoor air pollution: a public health perspective. Science, v. 221, no. 4605, July 1, 1983: 9-17.

Squires, Sally. Indoor air pollution: confronting America's newest health hazard. Washington post health, v. 2. Sept. 16, 1986: 14-18.

ADDITIONAL SOURCES OF INFORMATION

American Academy of Allergy and Immunology
611 E. Wells Street
Milwaukee, Wisconsin 53202
Telephone: (414) 272-6071

American Industrial Hygiene Association
475 Wolf Ledges Parkway
Akron, Ohio 44311-1087
Telephone: (216) 762-7294

Environmental Protection Agency
Office of Public Affairs
401 M Street, S.W.
Washington, D.C. 20460
Telephone: (202) 382-3324

National Council for Clean Indoor Air
316 Pennsylvania Avenue, S.E.
Suite 400
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Telephone: (202) 547-0005

National Institute for Occupational Safety and Health (NIOSH)
Health Hazard Evaluation Program
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4676 Columbia Parkway
Cincinnati, Ohio 45226
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